

EXHIBIT E

Jan. 23, 1968

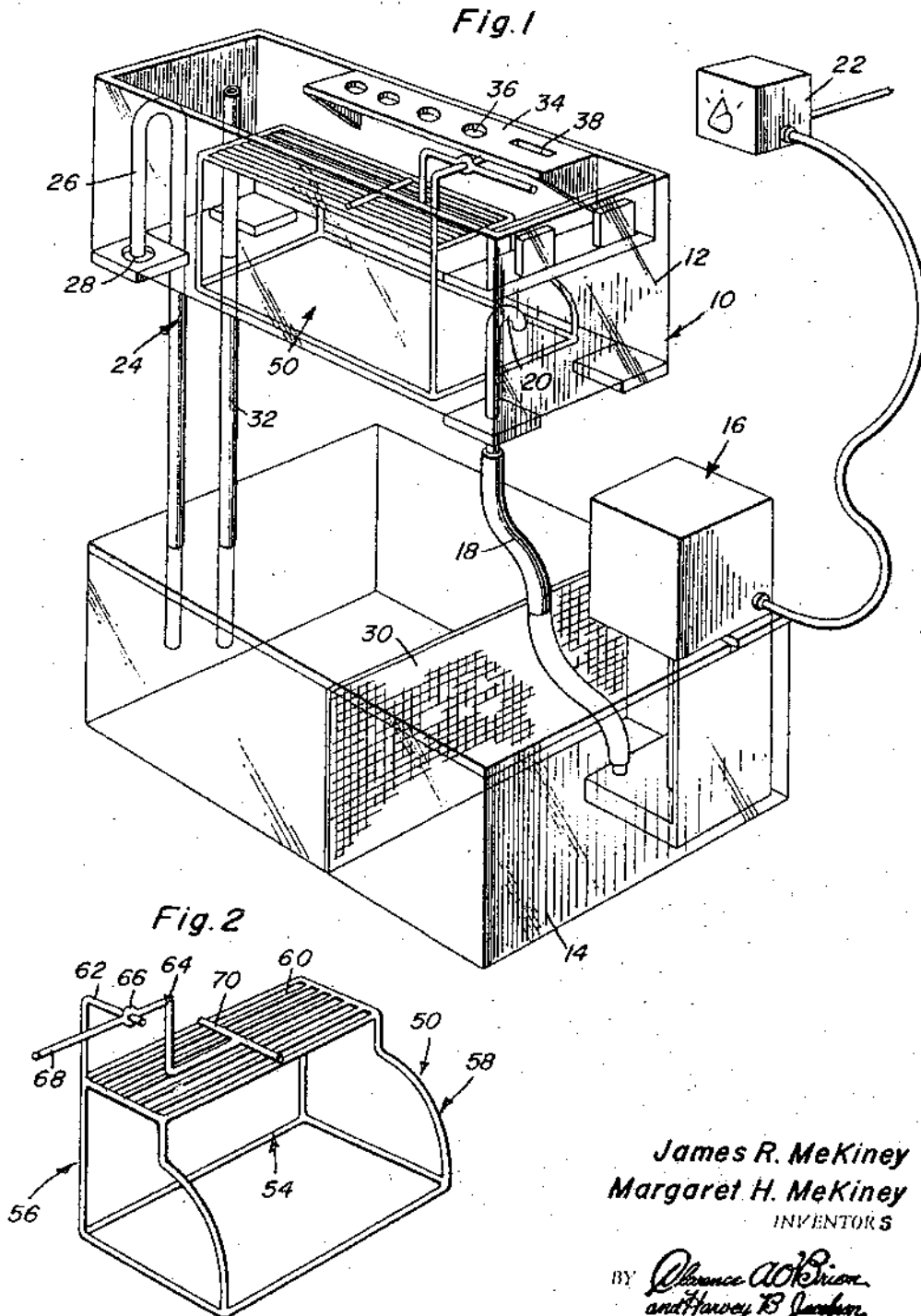
J. R. ME KINEY ETAL

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STERILIZER UNIT FOR BARBER TOOLS

Filed Sept. 12, 1963

2 Sheets-Sheet 1



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STERILIZER UNIT FOR BARBER TOOLS

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Fig. 3

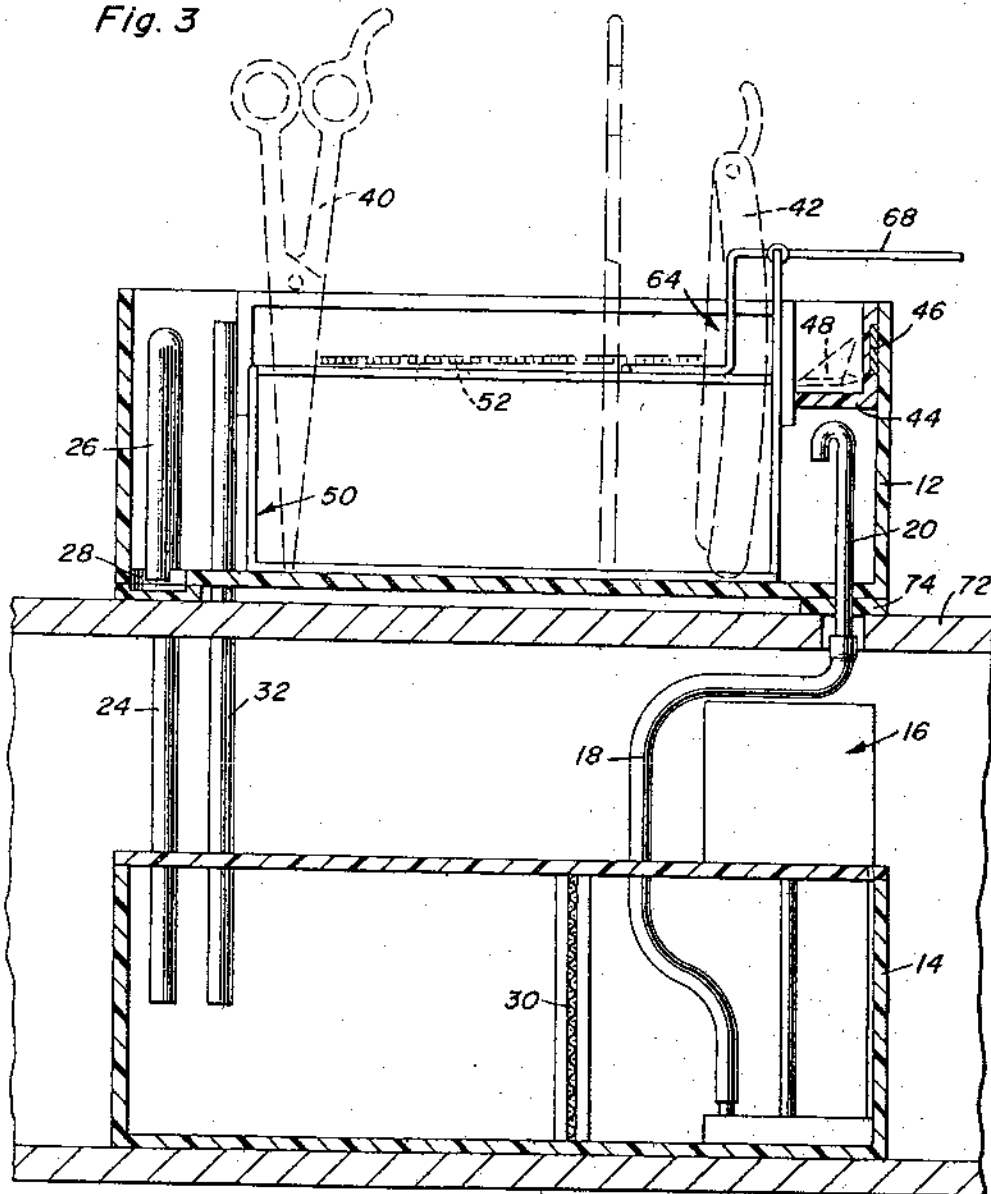
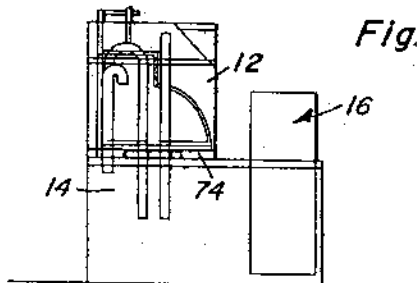


Fig. 4



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STERILIZER UNIT FOR BARBER TOOLS

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6 Claims. (Cl. 21-37)

ABSTRACT OF THE DISCLOSURE

A sterilizer tank into which instruments to be sterilized may be placed and having sterilizing fluid handling means operatively associated therewith for automatically pumping sterilizing fluid into the tank to a predetermined level for a predetermined time interval in response to actuation of a single control and to then drain said tank of the sterilizing fluid therein after the time interval has been completed.

This invention primarily relates to a sterilizer unit for sterilizing various tools used by a barber in his trade such as a razor, shears and combs and the like.

Under the law of most states, a barber must sterilize all of his tools between their use on each of his customers. Most sterilizers used for this purpose are simply tanks or jars containing sterilizing fluid into which the barber immerses his shears, combs and other tools. This necessitates the removal of the instruments out of the fluid and wiping them dry before each use. This in itself is not only unsanitary but consumes a great amount of time.

In order to overcome the before noted deficiencies in the prior art, it is a primary object of this invention to disclose a sterilizer unit, especially adapted for use with but not limited to barber tools, in which the instruments may be placed, sterilized and dried between successive uses in a minimum amount of time and automatically.

In order to carry out the preceding object, it is a further object of this invention to disclose a sterilizer unit comprising a pair of vertically spaced tanks between which sterilizing fluid is adapted to be circulated by means of a pump. In more particular, the pump is adapted to pump fluid from the lower tank to the upper tank and the device includes a timer operatively connected to the pump for regulating the operating cycle of the pump whereby the amount of sterilizing fluid disposed in the upper tank may be controlled. The sterilizing fluid so disposed in the upper tank may be returned to the lower tank by means of a siphon extending between the two tanks. The operation of the siphon depends upon the amount of fluid disposed in the upper tank which is controlled by the timer means. Once the upper tank has been drained by the siphon, the instruments which are disposed in the upper tank are allowed to drain dry thereby removing the necessity of wiping the instruments dry and presenting the instruments in sterile condition for their next use.

A still further object of this invention resides in the fact that filter means are disposed in the lower tank between the siphon tube and the pump whereby all foreign substances such as loose hair and the like which ordinarily accumulates in and on most sterilizers may be filtered from the sterilizing fluid before it is returned to perform its sterilizing function.

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Yet another object of this invention resides in the fact that the lower tank and operating mechanism may be concealed from view thereby presenting a pleasing appearance of the sterilizer unit to the barber and his customers.

Still another object of this invention resides in the provision of a plurality of barber instrument support means disposed in the upper tank in the flow path of the sterilizing fluid whereby a plurality of barber's instruments may be held and supported to be sterilized by the sterilizing fluid. Some of said support means include means specifically designed for holding scissors and razors as well as magnetic clippers and still others of said support means comprises a removable rack for holding flat objects such as combs, tweezers and other items. This latter rack further comprises means for lifting instruments out of the sterilizing fluid if necessary.

A still further object of this invention resides in its simplicity in construction, ease of manufacture and efficiency in which it accomplishes its primary purpose.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a perspective view of the sterilizer unit comprising the subject matter of the instant invention.

FIGURE 2 is a perspective view of a removable rack which may be placed in the upper tank portion of the sterilizer unit for supporting flat objects or the like.

FIGURE 3 is a fragmentary cross sectional view taken through the longitudinal center of the sterilizer unit depicted in FIGURE 1.

FIGURE 4 is a side view in elevation of the sterilizer unit showing that the upper tank may be supported by the lower tank if desired.

Referring now to the drawings in detail, the sterilizer unit generally designated by the numeral 10 comprises an upper tank 12 and a lower tank 14. These tanks may be made of any suitable material such as plastic, ceramic, or stainless steel. The sterilizing fluid is adapted to be disposed in the lower tank 14 and pumped to the upper tank 12 wherein it will perform its sterilizing function before returning once again to the lower tank.

Seated on the lower tank 14 is a pump generally designated by the numeral 16. The pump 16 is of a modified sump-type and is adapted to pump the sterilizing fluid through a flexible conduit 18 extending between the tanks and into a tube 20 seated within the tank 12. The sterilizing fluid emanates from the tube 20 and fills the tank 12 in an amount dependent upon the operating cycle of the pump 16. In order to control the operating cycle of the pump 16, the sterilizer unit 10 includes a timer 22 of a conventional type which automatically causes the pump to cease operating after a predetermined time interval.

Also extending between the tanks 12 and 14 is a siphon tube 24. Once the liquid level in the tank 12 rises above the height of the short tube portion 26 of the siphon tube 24, the sterilizing fluid will be returned through the siphon tube to the lower tank 14. This will occur if the timing cycle of the pump 16 set by the timer 22 allows the sterilizing fluid to accumulate to the aforementioned height in the tank 12. However, the timer 22 can also be

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set so that the sterilizing fluid will not accumulate above the short length of pipe 26 wherein the sterilizing fluid can be caused to remain in the tank 12 for an indefinite period. After the pump is once again started, the sterilizing fluid will once again fill the tank 12 above the height of the short length of pipe 26 wherein the fluid will be returned to the tank 14. The numeral 28 indicates a well immediately below the siphon tube 26 wherein fluid may accumulate below the siphon tube short length 26 to begin the siphon action.

When the sterilizing fluid is returned to the tank 14, the fluid before it returns to the pump to be pumped back to the tank 12 must pass through a removable filter element 30 disposed between the side walls of the lower tank. This filter element removes loose hair and other foreign substances which are usually associated with barber's sterilizing equipment and thereby allows the presentation of clean sterilizing fluid to the barber's instruments which are adapted to be disposed in the upper tank 12. An overflow drain pipe 32 also extends between the upper and lower tanks to insure removal of the fluid from the tank 12 in case the siphon tube is rendered inoperative for any reason.

A plurality of instrument support means are disposed in the tank 12 in the flow path of the sterilizing fluid for holding and supporting instruments to be sterilized by said fluid. One of said support means comprises a shelf 34 having a plurality of apertures 36 cut therein as well as an elongated slot 38. The apertures 36 are adapted to receive and hold scissors such as shown at 40 while the elongated slot 38 is adapted to receive and hold razors such as shown at 42.

A second supporting element also comprises a shelf 44 which is L-shaped and secured to one of the end walls of the upper tank 12. Embedded within the vertical leg of the shelf 44 are a plurality of magnets such as 46. This shelf is specifically adapted to support clipper blades such as 48 which will be retained and held on the shelf 44 by means of the magnets 46.

A third instrument support means comprises a removable rack such as generally indicated by numeral 50 which is also adapted to be seated within the upper tank 12 and is specifically adapted to support substantially flat articles such as combs 52, tweezers or the like. As specifically shown in FIGURE 2, the rack 50 includes a rod frame including a rectangular base portion 54 and a pair of up-standing end frames 56 and 58. The top of the rack includes a planar supporting surface comprising a plurality of spaced parallel rods 60. The tweezers and combs may be disposed on said surface. The rack further includes an L-shaped extension 62 which forms a hanger and pivot axis for a lever 64. The lever 64 includes an eye 66 through which a horizontal portion of the L-shaped hanger 62 may be disposed. As viewed in FIGURE 2, the portion of the lever 64 to the left of the eye 66 comprises an actuating handle 68 for moving a T-shaped head 70 at the opposite end of the lever 64 up and down. Some of said instruments 52 may be placed upon the T-shaped head whereby upon actuation of the handle 68, the instruments may be raised up and away from the planar supporting surface of the rack 50. In this manner, the operator of the sterilizer unit may retrieve combs or the like even though the sterilizing fluid still remains in the tank 12.

With specific reference now to FIGURE 3, it will be observed that the lower tank 14 of the sterilizer 10 may be hidden from view of the barber and his customers by enclosing it behind a suitable partitional wall such as 72. The tank 12 may be formed with a plurality of legs such as 74 whereby it may be seated upon the partition 72. As an alternative, if desired, the upper tank 12 may be seated directly upon the lower tank 14 as indicated in FIGURE 4.

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The operation of the sterilizer unit should now be readily apparent. The barber's tools, that is the razor, shears, combs or the like, are placed in their individual racks and supports disposed in the upper tank 12 of the sterilizer unit 10. By turning on the timer 22, the sterilizing fluid in the tank 14 will be pumped to and over the tools in the tank 12. This approximately takes one minute. If the timer is set to shut off before the fluid reaches the top of the short length of tubing 26 of the siphon tube 24, the fluid will remain in the upper tank 12. However, if the pump is allowed to substantially fill the container 12, the siphon tube 24 automatically drains the container 12, leaving the tools to drip dry for immediate use. Before the next pumping cycle, all foreign matter is filtered from the sterilizing fluid by means of the filter element 30 disposed in the lower tank 14. The whole operation takes approximately 3 minutes. Further, the whole bottom tank and its associated apparatus may be concealed behind a suitable partitional wall such as 72.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A sterilizing unit comprising upper and lower tanks, fluid passage means communicating the lower tank with the upper tank, pump means operatively associated with said fluid passage means for pumping sterilizing fluid from said lower tank into said upper tank through said fluid passage means, siphon means operatively associated with said tanks for automatically siphoning fluid from said upper tank into said lower tank in response to an increase in the fluid level in said upper tank to a predetermined level below the top of said upper tank, overflow passage means communicating said upper and lower tanks and operative to pass all fluid pumped into said tank above a second predetermined level spaced above the first-mentioned predetermined level downwardly into said lower tank, and adjustable timer controlled drive means connected to said pump operative to initiate and subsequently automatically terminate operation of said drive means after a selected period of operation of said drive means.

2. The unit of claim 1 wherein said upper tank includes means for supporting instruments within said upper tank at an elevation above the bottom of the upper tank and below said predetermined level.

3. The unit of claim 1 including instrument support means comprising a shelf secured to a wall of said upper tank, said shelf including a plurality of openings for receiving instruments to be sterilized.

4. The unit of claim 1 including instrument support means comprising a removable rack seated within said upper tank, said rack including an elongated substantially horizontal planar instrument supporting surface below said predetermined level, and instrument removal means for lifting instruments from said planar supporting surface above said predetermined level.

5. The unit of claim 1 including instrument support means comprising a shelf secured to a wall of said upper tank, said shelf including at least one magnet for holding and retaining a magnetizable instrument to be sterilized.

6. The combination of claim 1 including instrument support means comprising a removable rack seated within said upper tank, said rack including an elongated substantially horizontal planar instrument supporting surface below said predetermined level, and instrument removal means for lifting instruments from said planar supporting surface above said predetermined level, said instrument removal means comprising a cross head disposed below said predetermined level and extending trans-

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versely of said supporting surface and carried by the lower end of an upstanding level whose upper end portion is pivotally supported from said rack for rotation about a horizontal axis disposed above said predetermined level and extending transversely of said supporting surface, said crosshead being adapted to have corresponding end portions of elongated instruments disposed on and extending longitudinally of said supporting surface rested thereon for elevation of said corresponding end portions above said predetermined level upon upward swinging movement of said crosshead.

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EXHIBIT F

Nov. 18, 1969

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WASHING AND STERILIZING DEVICE

Filed Feb. 13, 1967

2 Sheets-Sheet 1

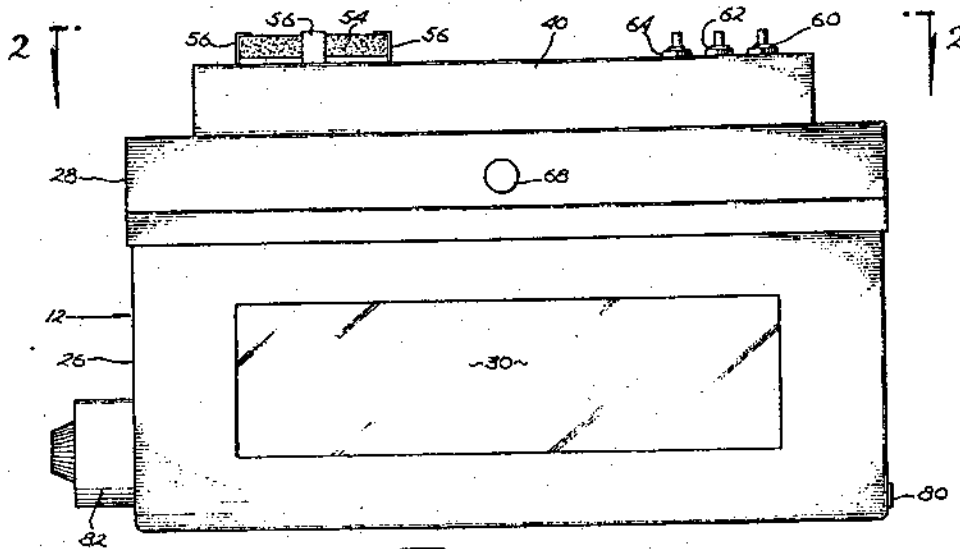


FIG. 1

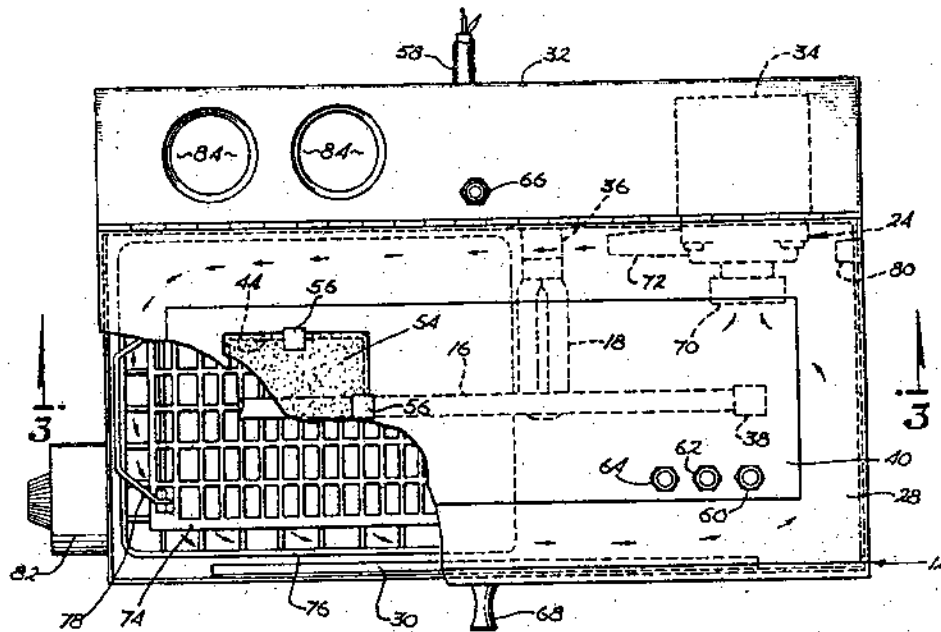


FIG. 2

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WASHING AND STERILIZING DEVICE

Filed Feb. 13, 1967

2 Sheets-Sheet 2

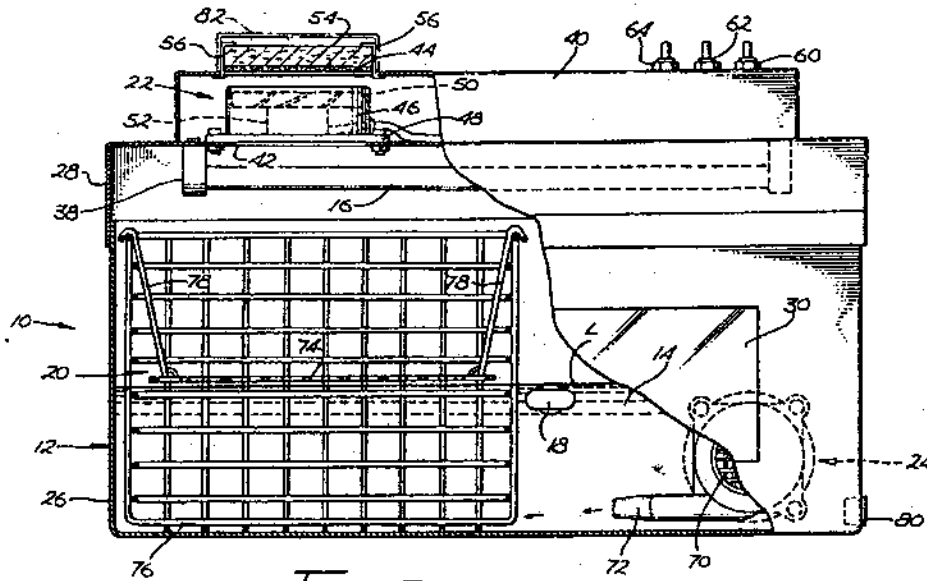


FIG. 3

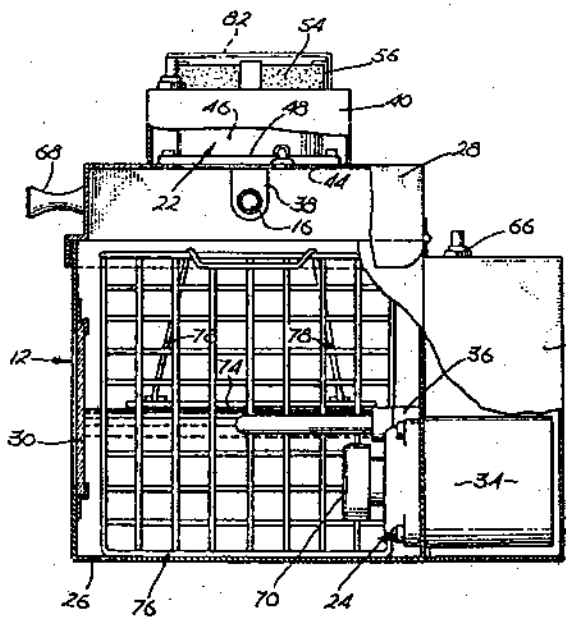


FIG. 4

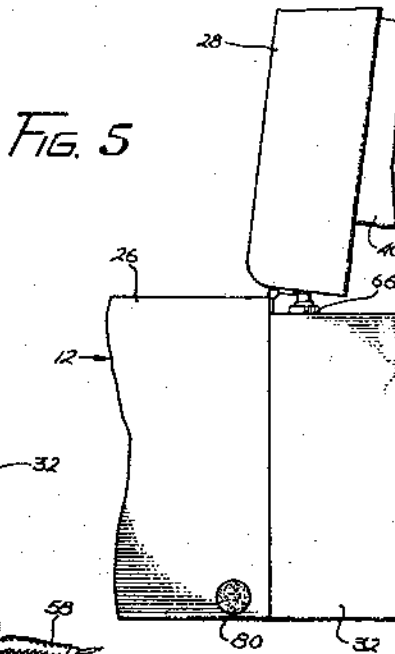


FIG. 5

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WASHING AND STERILIZING DEVICE

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6 Claims

ABSTRACT OF THE DISCLOSURE

An implement washing and sterilizing device having a liquid container for supporting an implement in an initial washing position within the contained liquid and a subsequent sterilizing and drying position above the liquid, wherein the implement is exposed to the direct rays of a germicidal lamp within the container and in the path of drying air circulated through the container by a blower which exhausts ozone gas generated by the lamp to atmosphere through a deodorizing cartridge.

This invention relates generally to sterilizing equipment and, more particularly, to a sterilizing device which utilizes the sterilizing action of a germicidal lamp.

A variety of sterilizing devices have been devised. Among the existing sterilizing devices, for example, are thermal sterilizers, such as autoclaves which rely on the sterilizing action of high temperature heat, gas sterilizers which rely on the sterilizing action of certain sterilizing gases, and sterilizers, such as the present sterilizer, which employ a germicidal lamp as the sterilizing medium. The existing sterilizers are characterized by certain inherent deficiencies which this invention seeks to overcome. The high temperature heat involved in the operation of autoclaves and other thermal sterilizers, for example, destroys the edges of blades and other sharp implements. Moreover, caution must be exercised when removing implements from a thermal sterilizer to avoid serious burns. Gas sterilizers, on the other hand, are generally characterized by excessive size, cost and complexity. The existing germicidal lamp sterilizers do not possess the noted deficiencies of either the thermal sterilizers or the gas sterilizers. The existing germicidal lamp sterilizers, however, are deficient in that they are either totally incapable of washing and drying the implements to be sterilized or produce a very inefficient washing and drying action on the implements.

It is a general object of the present invention to provide an improved sterilizing device which utilizes the sterilizing action of a germicidal lamp.

Another object of the invention is to provide a germicidal lamp sterilizing device wherein the implements to be sterilized are initially washed in a body of liquid with a unique whirlpool action and are then dried during sterilizing exposure to the germicidal lamp by drying air flow over the implements induced by a blower which exhausts ozone gas generated by the germicidal lamp to the surrounding atmosphere.

A related object of the invention is to provide a sterilizing device of the character described wherein ozone gas flow from the device occurs through a removable deodorizing cartridge.

Other objects of the invention are concerned with providing a sterilizing device of the character described which is relatively simple in construction, economical to manu-

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facture, compact in size, light in weight, and otherwise ideally suited to its intended purposes.

Other objects, advantages and features of the invention will become readily evident as the description proceeds, taken in conjunction with the accompanying drawings, in which:

FIGURE 1 is a front elevation of a sterilizing device according to the invention;

FIGURE 2 is a top plan view of the device looking in the direction of the arrows on line 2—2 in FIGURE 1, a portion of the device being broken away for the sake of clarity;

FIGURE 3 is a section taken on line 3—3 in FIGURE 2;

FIGURE 4 is a vertical transverse section through the sterilizing device; and

FIGURE 5 is a fragmentary end elevation of the sterilizing device showing a movable lid of the device in its open position.

In general terms, the sterilizing device 10 of the invention which has been selected for illustration in the drawings comprises a container 12 for containing a body of liquid 14. The level L of this liquid shown in FIGURE 3 is hereinafter referred to as the normal level of the liquid or simply the normal liquid level. Mounted within the container 10 are a pair of germicidal lamps 16 and 18. These germicidal lamps are preferably ultraviolet ray lamps, although other types of germicidal lamps may be employed in the device. The germicidal lamp 16 is mounted above the normal liquid level L. The germicidal lamp 18 is mounted below the normal liquid level. The sterilizing device is equipped with means 20 for supporting an implement to be sterilized in an initial washing position within the liquid and a subsequent drying and sterilizing position above the liquid wherein the implement is directly exposed to the bacteria-destroying rays from the sterilizing lamp 16. When in this drying and sterilizing position, the implement is dried by air flow over the implement. To this end, the sterilizing device 10 is equipped with a blower 22 for inducing air circulation through the container 12 and over the implement.

It is well known that a germicidal lamp, such as those employed in the present sterilizing device, generates ozone gas. One feature of the present invention resides in the arrangement of the blower 22 which is effective to exhaust from the container 10 to the surrounding atmosphere the ozone gas generated within the container by the upper germicidal lamp 16. This expulsion of the ozone gas to the surrounding atmosphere is beneficial for the reason that it produces a sterilizing action in the surrounding atmosphere. The lower germicidal lamp 18 produces a sterilizing action in the liquid 14 and may generate ozone in the liquid to aid its sterilizing action.

Mounted in the container 10, below the normal liquid level L, are means 24 for agitating the liquid 14 to promote washing of implements supported in their washing position within the liquid. A feature of the invention in this regard resides in the fact that the agitating means 24 comprise a pump for inducing in the liquid a whirlpool action which is effective to rapidly and thoroughly wash the implements. This whirlpool action also induces circulation of the liquid past the submerged germicidal lamp 18. In this latter regard, it is known that the rays from a sterilizing lamp are capable of penetrating a liquid only a relatively short distance. The use of the present

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whirlpool action to constantly circulate the liquid past the submerged germicidal lamp, therefore, is beneficial for the reason that substantially the entire body of liquid is effectively exposed to the sterilizing action of the lamp.

According to a further feature of the invention, the liquid 14 which is utilized in the present sterilizing device may comprise a buffered saline and sodium dodecyl sulfate solution having a sodium dodecyl content on the order of 0.1%, for example. It has been found that the rays from a germicidal lamp, such as the submerged lamp 18, when exposed to such a solution generate ozone within the liquid which promotes the sterilizing action of the lamp.

Briefly, in use of the sterilizing device 10, an implement to be sterilized is initially supported in its washing position within the container 12, wherein the implement is submerged within the liquid 14. The liquid agitating means or circulating pump 24 is then operated to induce a whirlpool action in the liquid which thoroughly washes the implement. The whirlpool action also effectively exposes the entire body of liquid 14 to the sterilizing rays of the submerged germicidal lamp 18.

Referring now in greater detail to the illustrated sterilizing device 10, the container 12 has a lower rectangular liquid tank 26 with an open top closed by a hinged cover or lid 28. Mounted in the front wall of the tank is a transparent window 30 through which the liquid 14 in the tank is visible. This window may comprise a tinted translucent plate secured and sealed to the inner side of the wall, as shown. The circulating pump 24 is mounted on the front side of the rear tank wall, below the normal liquid level L. At the rear of the tank is a compartment 32 which houses the pump motor 34. A gasket or other suitable sealing means (not shown) are provided between the pump and the rear housing wall to prevent leakage of liquid from the tank 26 into the compartment 32. The submerged germicidal lamp 18 is removably mounted in a liquid-tight socket 36 secured to the rear tank wall, below the normal liquid level L. The ballast (not shown) for this lamp may be housed in the rear compartment 32.

The tank lid 28 has an upper wall bounded by a depending flange which defines in the lid a chamber opening downwardly toward the tank 26. The germicidal lamp 16 is located within this chamber and is secured at its ends to sockets 38 attached to the underside of the upper lid wall, as shown. Mounted on the top of the lid is a compartment 40 which houses the blower 22 and the ballast (not shown) for the germicidal lamp 16. The upper wall of the lid 28 and the upper wall of the compartment 40 have aligned openings 42 and 44 which communicate the interior of the container 12 to atmosphere.

Blower 22 is conventional and includes an outer cylindrical shroud 46 having a lower flange 48 which seats on the upper wall of the container lid 28 about the lid opening 42. This flange is bolted to the lid, as shown. Rotatably mounted within the shroud 46, for turning on the axis of the shroud, is a fan 50. This fan is driven in rotation by a motor 52 concentrically mounted within the shroud. It is evident at this point that the blower 22 is effective to exhaust air from the container 12 to atmosphere through the opening 42 in the container lid 28 and the opening 44 in the upper lid compartment 40.

Extending across the opening 44 in the upper lid compartment 40 is a deodorizing cartridge 54. This deodorizing cartridge may comprise a fibrous pad impregnated with a suitable deodorizing agent. The deodorizing cartridge or pad may be releasably secured to the upper wall of the lid compartment 40 in any convenient way, as by means of spring clips 56. It is now obvious, therefore, that during operation of the blower 22, exhaust air flow from the container 12 occurs through the deodorizing cartridge 54, which is thereby effective to deodorize the emerging air. Preferably, the deodorizing agent embodied in the cartridge also imparts a fragrance to the emerging air.

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Electrical power for energizing the germicidal lamps 16, 18, the circulating pump motor 34, and the blower motor 52 is conducted to the sterilizing device 10 through an electrical cable 58. The pump motor 34 and the blower motor 52 are energized from this cable through switches 60 and 62, respectively, which are mounted on the top wall of the upper lid compartment 40. The germicidal lamps 16, 18 are energized from the power cable 58 through a pair of switches 64 and 66. These switches are arranged in electrical series, such that both switches must be closed to energize the lamps. Switch 64 is mounted on the upper wall of the lid compartment 40 and is manually operated. Switch 66 is mounted on the upper wall of the rear tank compartment 62 in a position such that the switch is depressed and thereby opened by the container lid 28 when the latter is rotated to its open position of FIGURE 5. The switch is released to reclose upon closing of the lid. Thus, closing of the manual lamp switch 64 conditions the germicidal lamps 16, 18 for energizing upon closing of the container lid 28. The container lid, when opened, depresses the lamp switch 66 to turn off the germicidal lamps. If desired, a handle 68 may be mounted on the container lid 28 to facilitate opening and closing of the lid.

The circulating pump 24 has an axial intake 70 through which the liquid 14 is drawn into the pump and a tangential outlet 72 through which the liquid is expelled from the pump. This outlet opens circumferentially of the container tank 26, as shown. It is evident, therefore, that the circulating pump 24 is effective to induce vortical circulation of the liquid 14 through the tank and, thereby, to produce within the liquid the whirlpool action referred to earlier.

The illustrated implement positioning means 20 comprises a perforated tray 74 for holding an implement to be washed and sterilized and locating the implement in its aforementioned washing and sterilizing positions. It will be recalled that in its washing position, the implement is submerged in the liquid 14, and in its drying position, the implement is located above the liquid for direct exposure to the rays of the germicidal lamp 16. According to the present invention, this location of the implement in its washing and sterilizing positions may be accomplished in two alternative ways, to wit, by retaining the level of the liquid 14 constant and vertically shifting the implement tray 74 between its elevated drying and sterilizing position of FIGURE 3 and a submerged washing position within the liquid, and by retaining the implement tray in a fixed position and adjusting the level of the liquid.

To these ends, the implement tray 74 is contained within a perforated basket 76 which is removably mounted within the tank 26. The tray is equipped with pivoted hooks 78 which may be engaged over the upper edge of the basket 76, in the manner illustrated in FIGURE 3, to support the tray in its elevated position of the latter figure. In this position, the tray is located above the normal liquid level L, whereby an implement on the tray is removed from the liquid 14. In this position, then, the tray supports the implement in its drying and sterilizing position. The tray 74 may be lowered into the liquid 14, to locate an implement on the tray in its submerged washing position within the liquid, by disengaging the tray hooks 78 from the basket 76 and lowering the tray to the bottom of the basket.

To permit adjustment of the level of the liquid 14, one end of the container tank 26 is provided with a fitting 80 through which the liquid 14 may be fed to and drained from the tank. According to the alternative method referred to earlier, of locating an implement in its washing and sterilizing positions, the implement tray 74 is supported in its elevated position of FIGURE 3, and the liquid 14 is initially fed to the container 12, through the fitting 80, until the liquid level rises above the implement on the tray. The implement is then submerged in its wash-

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ing position within the liquid. After washing, liquid is drained from the container through the fitting 80 until the liquid level drops below the tray, thus to locate the implement on the tray in its sterilizing position above the liquid. A hose (not shown) may be provided for connecting the fitting 80 to a liquid source, such as a water tap, and to a drain.

The operation of the illustrated sterilizing device 10 is believed to be obvious from the preceding description. Thus, an implement to be washed and sterilized is placed on the tray 74 and is initially submerged to its initial washing position in the liquid 14, either by lowering the tray to the bottom of the basket 76 or by supporting the tray in its elevated position of FIGURE 3 and feeding additional liquid to the container 12, through the fitting 80, until the liquid level rises above the implement. The container lid 28 is then closed and the germicidal lamps 16, 18 and the circulating pump motor 34 are energized. Operation of the circulating pump 24 induces a whirlpool action in the liquid 14 which circulates the liquid over the implement on the tray 74 to thoroughly wash the implement. This whirlpool action also exposes substantially the entire body of the liquid 14 to the bacteria destroying rays of the submerged germicidal lamp 18. In the event the liquid 14 is a buffered saline and sodium dodecyl sulfate solution of the kind mentioned earlier, exposure of the liquid to the rays from the submerged germicidal lamp 18 generates ozone in the liquid, thereby enhancing the sterilizing action of the lamp.

After the implement has been thoroughly washed, the circulating pump 24 is stopped, the blower 22 is started, and the implement is placed in its drying and sterilizing position, either by elevating the implement tray 74 to its position of FIGURE 3 or draining the liquid 14 from the container 12, through the fitting 80, until the liquid level drops below the tray. In this sterilizing position of the implement, the latter is directly exposed to the bacteria destroying rays from the upper germicidal lamp 16 and is thereby sterilized by the lamp. In this regard, a feature of the invention resides in the fact that the tray 74 may be constructed of a reflective material, such as aluminum, which is effective to reflect the rays of the lamp upwardly to the undersides of the implement. All surfaces of the implement are thereby effectively sterilized. Simultaneously, the implement is exposed to the circulating air flow which is induced within the container 12 by the currently operating blower 22. This air flow over the implement effectively dries the latter.

As noted earlier, the blower 22 also exhausts the ozone gas generated by the germicidal lamp 16 from the container 12 to atmosphere through the deodorizing cartridge 54, thus to produce a sterilizing action in the surrounding atmosphere. If desired, the sterilizing device 10 may be equipped with a removable cover 82 which may be placed over the cartridge 54 for closing the exhaust opening 44 in the upper container lid compartment 40, thereby to divert the air flow from the blower 22 back into the container 12 for more efficient drying of the implement currently supported in its drying position on the implement tray 74. In this case, the upper wall of the container lid 28 is provided with openings (not shown) through which the diverted air flow may pass from the interior of the compartment 40 to the interior of the container 12.

A timer 82 may be mounted on one end of the container 12 for timing the operation of the sterilizing device. Also, the rear compartment 32 may have receptacles 84 for holding implements to be sterilized or other objects.

A small motor may be enclosed in the casing at the rear of the container with special attachments for interchangeable brushes for removal of hard substances and stains from the articles being sterilized. Also, two revolving brushes rotating in opposite directions and spaced to receive hair clippers and other instruments may be

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provided to remove hairs and other particles from such instruments for cleaning purposes.

While the instant invention has been shown and described herein in what is conceived to be the most practical and preferred embodiments, it is recognized that departures may be made therefrom in the scope of the invention, which is therefore not to be limited to the details disclosed herein, but is to be afforded the full scope of the claims.

What is claimed is:

1. A washing and sterilizing device comprising:
 - a container having a top opening and a cover for closing said opening,
 - said container being adapted to be filled with a washing liquid to a given liquid level,
 - a lower germicidal lamp mounted within said container below said liquid level,
 - an upper germicidal lamp mounted within said container above said liquid level,
 - a power driven recirculating pump mounted within said container having an inlet and an outlet opening to the interior of said container below said liquid level for inducing forced circulation of said liquid about the interior of said container and past said lower germicidal lamp to effect sterilizing of said liquid by the rays from said lower lamp,
 - a fan mounted within said container above said liquid level for inducing air circulation about the interior of said container and past said upper germicidal lamp to effect sterilizing of the air by the rays from said upper lamp, and

means within said container for selectively supporting articles to be washed at either a submerged washing position in said liquid wherein said articles are disposed to be washed and sterilized by circulation of said liquid over said articles, or at a draining position above said liquid wherein said articles are disposed to be sterilized by rays from said upper germicidal lamp and dried by circulation of air over said articles.

2. A washing and sterilizing device according to claim 1 wherein:

said pump outlet is located adjacent a side wall of said container and opens generally circumferentially of said container for inducing whirlpool circulation of said liquid around the interior of said container.

3. A washing and sterilizing device according to claim 1 wherein:

said container has an exhaust opening to the atmosphere located opposite the exhaust side of said fan, whereby sterilized air may exhaust from said container through said exhaust opening, and

a removable closure for sealing said exhaust opening to effect recirculation of air within said container only.

4. A washing and sterilizing device according to claim 3 including:

a porous filter to be impregnated with a deodorizing agent, and means removably mounting said filter within said exhaust opening.

5. A washing and sterilizing device according to claim 1 wherein:

said cover has spaced inner and outer walls defining an intervening chamber, and exhaust openings in said walls communicating the interior of said container to atmosphere,

said fan is mounted within the exhaust opening in said inner cover wall for inducing air flow from the interior of said container into said intervening chamber,

said inner cover wall has a return opening communicating said intervening chamber to the interior of said container, and

a removable closure for selectively sealing the exhaust opening in the outer cover wall, whereby air

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may be either recirculated only within said container or exhausted from said container to the atmosphere.

6. A washing and sterilizing device according to claim 5 wherein:

said pump outlet is located adjacent a side wall of said container and opens generally circumferentially of said container for inducing whirlpool circulation of said liquid around the interior of said container.

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EXHIBIT G

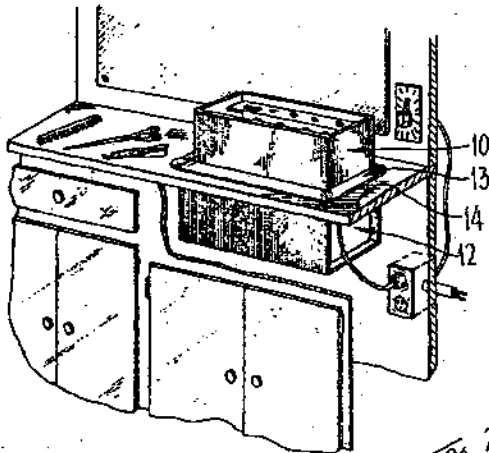
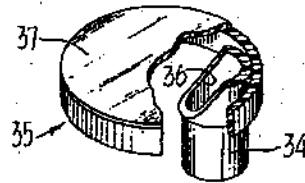
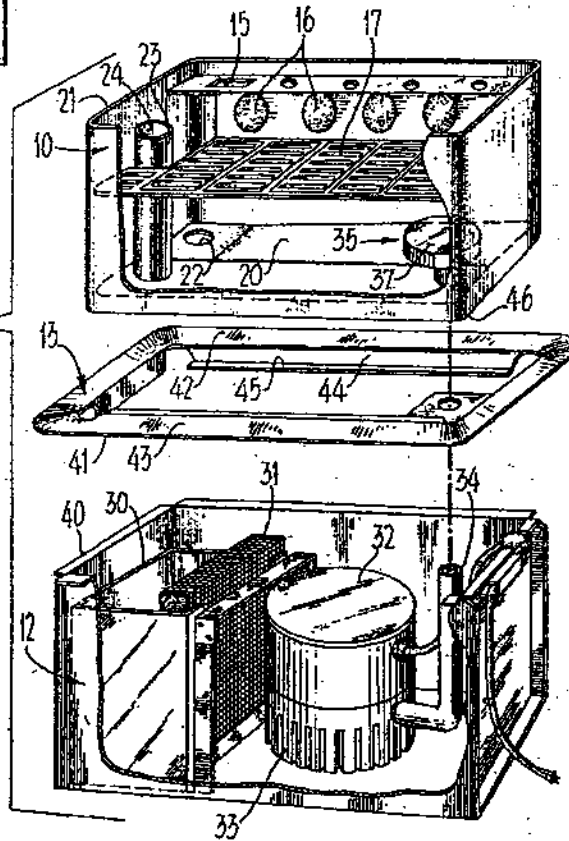
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CLEANING AND STERILIZING APPARATUS FOR BARBERING TOOLS

Filed Nov. 30, 1967

Fig. 1Fig. 3Fig. 2

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2 Claims

ABSTRACT OF THE DISCLOSURE

An apparatus for cleaning and sterilizing barbering tools and the like wherein a sterilizing fluid is circulated over the tools to remove the dirt, oil, and hair. The dirt, oil, and hair are washed away by the circulating cleaning fluid and collected and retained in a filter tank while the tools drain and dry in a sterile condition.

BACKGROUND OF THE INVENTION

The present invention relates to cleaning and sterilizing apparatus, and more particularly to an apparatus designed to clean the tools used in a barber shop. The tools used in a barber shop accumulate loose hair, hair oil, and other foreign matter while cutting the customer's hair. The loose hair, hair oil, and foreign matter must be removed before the next customer's hair is cut, and the tools sterilized to prevent possible transfer of skin disorders from one customer to another. Other tools used in a barber shop also accumulate foreign matter that must be removed prior to using the tools on a new customer.

In the past, and in many shops, the tools have been cleaned by physically removing the dirt and loose hair by wiping the tools with a towel or brushing off the tools. After the tools were cleaned they were placed in a cabinet to sterilize them by means of ultraviolet light or other means such as immersion in a sterilizing solution.

The above procedures involve considerable manual labor and do not produce the best results. For example, if the tools are covered with hair oil, it will not be removed by wiping or brushing. The tools of course could be washed to remove the oil, but this would result in a considerable amount of time on the part of the barber to effect the cleaning, and still necessitate a subsequent sterilizing operation. Also, placing of tools in a sterile solution does not assist in removal of foreign objects, and even with such a solution, the tools are not rendered bacteria static, since bacteria will remain on the hairs, etc., and subject the customer to possible contamination.

BRIEF DESCRIPTION OF THE INVENTION

The present invention solves all of the above problems by providing a cleaning apparatus that removes the loose hair, hair oil, and other dirt from barbering tools. At the same time that the tools are cleaned they are sterilized. The invention utilizes a cleaning tank having racks for mounting or holding the tools during the cleaning operation. The cleaning tank is mounted above a second storage tank that contains a filter for filtering, a cleaning and sterilizing fluid, and a pump for circulating the fluid. The pump circulates the fluid to the cleaning tank where it flushes and washes the hair, hair oil, and other dirt from the tools. The fluid is circulated in a manner to wash all of such foreign matter from the cleaning tank into a filter tank. This insures that the hair and dirt once removed from the tools will not resettle on the tools when the circulation of the cleaning fluid is stopped. The filter tank can be periodically removed to clean the filter and tank.

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BRIEF DESCRIPTION OF THE DRAWINGS

The above advantages of this invention and additional features will be more easily understood from the following detailed description of a preferred embodiment when taken in conjunction with the attached drawings in which:

FIGURE 1 is a perspective view of a cleaning apparatus constructed according to this invention and installed in a counter;

FIGURE 2 is an exploded perspective view of the cleaning apparatus shown in FIGURE 1; and

FIGURE 3 is a perspective view of the flow control means used for washing the hair and dirt from the cleaning tank.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to FIGURES 1 and 2 there is shown a cleaning and sterilizing apparatus constructed according to this invention. As shown, the cleaning apparatus utilizes a first or cleaning tank 10 and a storage tank 12. The storage tank is adapted to be positioned within an opening in a counter top 14 with a trim strip 13 providing a marginal covering around the opening. The cleaning and storage tanks may be fabricated from sheet metal and painted, or they can be fabricated from stainless steel, plastic or other non-corrosive material.

The cleaning tank is provided with a rack 15 and a series of magnets 16 for holding the tools while they are cleaned. A grid 17 is mounted in the tank for holding larger tools and is mounted approximately midway between the top and bottom of the tank. The cleaning tank is provided with a drain 22 at one end for draining the hair and dirt into the filter tank as explained below. The cleaning tank is provided with a sloping bottom 20 that slopes towards the end 21 of the cleaning tank containing the drain 22. The sloping bottom assists in draining the hair and dirt into the filter tank. An overflow pipe 23 is also mounted adjacent the end 21 of the cleaning tank. The height of the top 24 of the overflow pipe determines the level of the cleaning and sterilizing fluid in the cleaning tank.

The second or storage tank 12 contains a separate filter tank 30 having a filter 31 mounted therein. A submersible circulating pump 32 is also mounted in the storage tank. The circulating pump is provided with a suction inlet 33 at its bottom and a discharge connected to a discharge outlet 34 at its side.

The discharge outlet of the circulating pump is coupled to a flow control means 35. The flow control means is formed by the end of the discharge outlet that terminates in a beveled edge 36 and a mushroom cap 37 positioned over the open end of the discharge outlet. The flow control means serves the dual purpose of preventing splashing of the fluid and of controlling the circulation of the cleaning fluid to insure that the hair and dirt are washed from the cleaning tank.

The upper end of the walls of the storage tank terminate in outwardly projecting supporting flanges 40 which overlie the counter top around the opening therein, and which in turn are covered by the trim strip 13. The two sides 42 and 43 of the trim strip member are each provided with downwardly extending portions 44 that terminate in inwardly extending flanges 45. The lower edge 46 of the cleaning tank is removably supported on these flanges. When the cleaning tank is in position the upper end 36 of the discharge outlet of the pump extends into the mushroom cap 37 as shown.

OPERATION

The cleaning apparatus is assembled as shown in FIGURE 1 and the storage tank filled with a suitable cleaning and sterilizing fluid. The fluid may be a liquid containing

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a cleansing agent such as a detergent, and a sterilizing agent, and preferably a lubricant. The tools to be cleaned are placed in the cleaning tank either by positioning them in the rack 15 or laying them on the grid 17. The circulating pump is then started and the fluid circulated. It will be necessary to circulate the fluid for a time before the cleaning tank is filled. The time required will depend on the size of the drain 22 in relation to the capacity of the pump. After the tank is filled, the continued circulation of the fluid will wash the hair, waxes, hair oil, and other dirt from the tools. Normally, a few minutes of circulation is sufficient to thoroughly clean sterilize and lubricate the tools.

The hair and dirt removed from the tools will fall to the bottom of the cleaning tank. The flow control means 35 is designed to cause the cleaning fluid to flow along the bottom of the cleaning tank towards the drain 22. The flow of the cleaning fluid in combination with the sloping bottom of the cleaning tank will wash the hair and dirt down the drain into the filter tank.

The hair oil will normally be lighter than the cleaning fluid and thus will float on the surface of the fluid. The overflow 23 will tend to skim off the top layer of the cleaning fluid and thus remove the oil from the surface of the fluid. The oil, hair, and dirt will all be retained by the filter 31 located in the filter tank. After a period of approximately five minutes, the pump is stopped, and the fluid will all drain out through the drain 22, and the tools will tend to drip dry and remain in a sterile condition.

After the fluid has drained from the cleaning tank, the cleaning tank can be removed from the top of the storage tank. The filter tank and filter can then be removed from the storage tank and cleaned. After the filter and filter tank are cleaned they can be replaced and the cleaning tank reinstalled. The apparatus can then be placed in operation as explained above.

What is claimed is:

1. An apparatus for cleaning and sterilizing tools comprising: a cleaning tank having means for holding said tools, said cleaning tank having a bottom wall provided with a drain outlet, a storage tank positioned below said

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cleaning tank, fluid circulating means for circulating a cleaning and sterilizing fluid from said storage tank to said cleaning tank, an overflow pipe interconnecting said tanks to limit the height of fluid in said cleaning tank, said circulating means having a pumping capacity in excess of the drain capacity whereby fluid may be pumped into said cleaning tank up to the top of said overflow pipe, filter means in said storage tank to separate foreign matter from said cleaning fluid, and flow control means in said cleaning tank adjacent the bottom wall thereof for receiving fluid from said circulating means and directing the same along the bottom of the cleaning tank towards said drain outlet, said flow control means including a discharge outlet of said fluid circulating means terminating in a bevelled end, and a mushroom shaped cap overlying said bevelled end, said bottom wall of said cleaning tank sloping downwardly from said flow control means towards said drain outlet.

2. Apparatus as set forth in claim 1 in which said storage tank is provided with outwardly directed flange portions adjacent the upper portion thereof for supporting the tank within a counter opening, and inwardly directed flange means adjacent said flange portions for supporting the peripheral portions of the bottom wall of said cleaning tank.

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